

Name: *Key*

Date:

Topic:

Class:

Main Ideas/Questions Notes/Examples

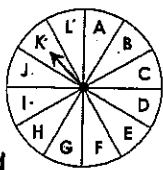
Fundamental
COUNTING PRINCIPLE

You can use the counting principle to find the total number of outcomes:
If one activity can occur in X ways and another activity can occur in y ways, then both activities can occur in $X \cdot y$ ways.

Examples

Example	# of Outcomes
1. To leave her office, Karen can choose between three sets of stairs and seven doors. How many ways can she leave her office?	$3 \cdot 7$ <i>21 ways</i>
2. A sweater comes in four sizes and eight colors. How many different sweaters are possible?	$4 \cdot 8$ <i>32 ways</i>
3. A class has 11 boys and 16 girls. How many ways can the teacher choose one boy and one girl?	$11 \cdot 16$ <i>176 ways</i>
4. A dinner menu consists of 5 appetizers, 12 entrées, and 3 desserts. How many ways can someone order one appetizer, one entrée, and one dessert?	$5 \cdot 12 \cdot 3$ <i>180 ways</i>
5. A card is chosen from a standard deck, then a die is rolled. How many outcomes are possible?	$52 \cdot 6$ <i>312 ways</i>
6. A quarter is tossed, then a letter from the word SNOWFLAKE is chosen. How many outcomes are possible?	$2 \cdot 9$ <i>18 ways</i>
7. A day of the week is chosen, then the spinner to the left is spun twice. How many outcomes are possible?	$7 \cdot 12 \cdot 12$ <i>1008 ways</i>
8. How many ways can someone randomly dial a 7-digit phone number?	10^7 <i>10,000,000 ways</i>
9. A quiz contains five multiple choice questions. Each question has four answer choices. How many ways can the questions be answered?	4^5 <i>20 ways</i>
10. The library codes their books using two letters followed by a digit 0-9. How many different codes are possible?	$26 \cdot 26 \cdot 10$ <i>6760 ways</i>

*10 10
100 100
1000 1000
10000 10000
100000 100000
1000000 1000000*



*84
x 12
168
1680
1808*

*260
x 26
1560
5200
6760*

11. Patrick is buying a new car. He can choose the body style, color, and engine type. If there are 54 ways he can select a car, with three body styles and two engine choices, how many colors are available?

$$3 \cdot 2 \cdot z = 54$$

$$6 \cdot z = 54$$

$$z = 9 \text{ colors}$$

12. At the school cafeteria, you can choose one sandwich, one snack, and one drink. The number of drink options is equal to the number of snack options. If there are 63 ways to choose your lunch, with seven different sandwich options, how many drink options do you have?

$$7 \cdot z \cdot z = 63$$

PROBABILITY

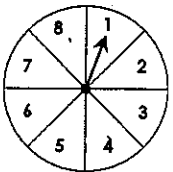
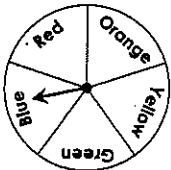
Examples

HT

~~HHT~~
~~HHT~~

HHH
HHT
HTH
HTT
TTT
TTH
THT
TTH

AH
AT



13. A coin is tossed three times. What is the probability of getting heads just once?

$$2 \cdot 2 \cdot 2 = 8 \text{ ways}$$

$$\frac{3}{8}$$

14. A month is chosen at random, then a standard die is rolled. What is the probability of getting February, then a number less than 5?

$$12 \cdot 6 = 72 \text{ ways}$$

$$\frac{4}{72} = \frac{1}{18}$$

15. A card from a standard deck is chosen at random, then a coin is tossed. What is the probability of getting an ace and tails?

$$52 \cdot 2 = 104$$

$$\frac{4}{104} = \frac{1}{26}$$

16. A standard die is rolled two times. What is the probability that it lands on 1 both times?

$$6 \cdot 6$$

$$\frac{1}{36} = \frac{1}{36}$$

Use for questions 17 and 18: Each spinner to the left is spun once.

17. What is the probability of getting yellow and an even number?

$$5 \cdot 8 = 40$$

$$\frac{4}{40} = \frac{1}{10}$$

18. What is the probability of getting orange or blue and a multiple of 3?

$$5 \cdot 8 = 40$$

$$\frac{4}{40} = \frac{1}{10}$$